Interoffice

BASF

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Date September 9, 1991

To Plant Personnel

From/Location A. J. Schweickart

Subject Hose Handling Issues

Copies

I have attached for you review a summary of responses to the July 11 survey on Hose Handling Issues.

The questions were directed at identifying potential hazards, hassles, and potential errors associated with a variety of hose handling activities. I have combined your answers into seven broad categories listed below:

1. Job Attitude
2. Hose Condition
3. Hose Selection
4. Hose Movement and Hookup
5. Product Transfer
6. Hose Blowout and Disconnect
7. Related Activities

Under each category, I have provided the following:

1. Potential hazards, hassles, and errors.
2. Negative consequences from the conditions or events.
3. The number of responders who identified each event.

It is obvious that you have identified a large number of potential issues. I would suggest to you that the best way to prevent these difficulties from occurring lies in two basic principals:

1. Attention To Detail - Be aware of the potential hazards and be uncompromising in your personal work standards.

2. Empowerment - Accept the fact that you are empowered in many areas to make decisions and to act directly to deal with issues. Don't wait for others to do this for you.

I hope that you find this analysis useful. Please contact me if you would like to discuss it further.

A. J. Schweickart

AJS/bc

Attachment

HOSE HANDLING ISSUES

ISSUE	NEGATIVE OUTCOME	NUMBER OF RESPONSES
1. JOB ATTITUDE		
A. Failure to have the right questioning attitude to a job (Mind not on work, rushing too much).	- Personnel Injury - Spill	7
B. Failure to wear proper safety equipment for job from start to finish.	- Personnel Injury	5
2. HOSE CONDITION		
A. Damaged hose used (bubbles crushed, worn).	- Sudden Failure - Spill - Burn	28
B. Damaged fittings used (broken ears, improper Kamlock threading).	- Sudden Failure - Spill - Burn	27
C. Frayed stainless hose used.	- Puncture Wound	8
D. Gaskets in poor condition (used, cracked, missing, hard).	- Sudden Failure - Continuous Leak	20
E. Sharp edges on Kamlock ears.	- Cut	1
3. HOSE SELECTION		
A. Wrong hose type used for product (wrong hose color, graft in conventional hose).	- Product Contamination	9
B. Wrong hose type used for product temperature (rubber hose used for <u>hot</u> product).	- Sudden Failure - Spill - Burn	4
C. Wrong hose used for utilities (N_2 Nitrogen hose used for steam).	- Sudden Failure - Burn	1
D. Banded hose used for transfer.	- Sudden Failure - Spill	3

HOSE HANDLING ISSUES

ISSUE		NEGATIVE OUTCOME	NUMBER OF RESPONSES
4.	**HOSE MOVEMENT AND HOOKUP**		
A.	Not enough hoses in work areas.	- Hose Damage from Dragging. - Muscle Strains	11
B.	Inconsistent fitting sizes in work areas. Leads to excessive connections (N^2, Product).	- More Connections increase risk of failure.	5
C.	Not enough tools, so right tool can be used for job.	- Wrong tool use leads to injuries.	1
D.	Improper routing of hose (through doors, walkways, load ramps).	- Tripping Hazard	19
E.	Number of hoses required is too long. (Tank car unloading to a truck, #8 reactor to #7 pump out, EPO).	- Excessive length increases risk of failure.	1
F.	Hose may be pressurized when pulling caps (TDI, MDI)	- Cap may blow off. - Personnel injury.	1
G.	Hose is hooked up to wrong transfer points (no pipe labels)	- Product contamination - Scrap reactor batch.	3
H.	Failure to inspect final hookup before transfer (open bleeds, bad connections).	- Product spill.	4
I.	Failure to stay within railings of tank cars (car off spot).	- Personnel injury - Fall	5
J.	Failure to use muffler during tank car venting before loading.	- Excess noise level - Hearing loss	1

HOSE HANDLING ISSUES

ISSUE	NEGATIVE OUTCOME	NUMBER OF RESPONSES
5. PRODUCT TRANSFER		
A. Failure to open discharge before supply valves.	- Dead head hose - Overpressization hose failure	3
B. Failure to leak check hoses before transfer of hazardous materials.	- Hazardous mechanical spill. - Environmental damage. - Personnel injury	2
C. Multiple hookups and disconnects during transfer (drum trailer loading and unloading).	- Increased risk of spill or injury.	2
D. Product is very hot during transfer.	- Increased burn potential	3
E. Failure to inspect hose and connections during transfer.	- Undetected problem - Spill	4
F. Failure to anticipate nitrogen flow when vessel empty (trailer at drumming, flash strippers).	- Product blows out of drums at drumming. - Hose jumps if connected at both ends. - Personnel Injury.	3

HOSE HANDLING ISSUES

ISSUE	NEGATIVE OUTCOME	NUMBER OF RESPONSES
6. HOSE BLOWING AND DISCONNECT		
A. Failure to properly blow and drain hoses after transfer.	- Product solidifies in hose. May cause over pressure on next transfer. - Spill	1
B. Failure to close supply valve first then discharge valve.	- Dead head pump. - Over pressure hose.	6
C. Failure to de-pressure before disconnect (missing bleed, frozen bleed, procedure error).	- Disconnect under pressure. - Personnel injury.	15
D. Failure to secure end of hose when drying.	- Hose end will whip. - Personnel injury.	1
E. Failure to take precautions with nitrogen hose and connections during use (product hose blowing, hose drying).	- Hose failure and whipping. - Personnel Injury.	1
F. Failure to take precautions with steam hose and connections during use (bleed steaming).	- Personnel injury. (Burn)	1
G. Failure to secure connections after disconnect (bleeds not plugged, caps not attached).	- Spill - Personnel injury.	1
H. Failure to put away hoses on racks.	- Tripping hazard.	1

HOSE HANDLING ISSUES

ISSUE	NEGATIVE OUTCOME	NUMBER OF RESPONSES
7. RELATED ACTIVITIES		
A. Equipment is moved routinely at EPO and Polyols to support product transfer. (portable meters, cyclone)	- Personnel injury - Fall - Muscle Strain	1
B. Tank truck loading has a fall potential (ramp design, walking trailer length).	- Personnel injury	6
C. Hazards increase during winter operation due to ice.	- Personnel injury	1